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THE AZORES, OR WESTERN ISLES. No. II.

FAYAL, WITH THE MOUNTAIN OF PICO.

FAYAL.

In this country, where Nature has done so much, and art and industry so little for its inhabitants, the practice of agriculture is but little, and the science of it less, known throughout the islands. "The rude system of their forefathers," says Captain Boid, "is still pursued, and their implements and utensils would be disgraceful to savages in the wilds of Africa. They merely turn over the soil, throw in the seed at random; and so bountiful is Nature, that a very short interval produces abundant returns. Such, in fact, is the capability of the soil, that were every advantage taken, these islands might furnish an ample supply of grain for the support of five or six millions of inhabitants, instead of 200,000. Even now they occasionally supply the markets of Lisbon, Oporto, and Madeira, with wheat, barley, and pulse, of all sorts."

Much good wine is made in these islands, that often passes for Madeira. Woad was formerly an important branch of commerce, and the sugar-cane was likewise cultivated. But, however industrious and commercially disposed the people of the Azores might be, the absolute want of a spacious, safe, and deep port, will ever prevent the commerce of these islands from rising to any great extent. Notwithstanding, the Dutch long ago exported fullers' earth in large quantities, from St. Michael's, and in the vale of Furnas, in the same island, there existed in the sixteenth century a manufactory of alum, that furnished 4833 quintals in the space of ten years.

If perchance it be deemed indispensable to give additional stimulus to the soil, they sow a crop of lupins, (which in these islands grow luxuriantly, and to an extraordinary size,) and, when about three feet high, they plough it all into the soil, which from the peculiarly fertilizing properties of this plant, receives a richness that soon renders it ready for the succeeding crop of grain. The lupin is a valuable herb in the Azores, and is everywhere cultivated to a great extent. The seeds, after being well soaked in salt, or sea-water, to divest them of their bitterness, constitute a favourite and most nutritious food for the lower orders, and the plant furnishes an excellent green meat for cattle, although, from its inebriating qualities, it should only be given in small quantities at a time.

Graciosa, St. Michael, and Fayal, may be considered, on account of the general superiority of soil, as the most flourishing in point of agriculture, and Pico, Terceira, and Santa Maria least so.

Settlers, and commercial visiters have, from time to time, introduced plants, herbs, and trees of various kinds, to such an extent, from all parts of the world, that the Azores already produce all the classes peculiar to northern, as well as many belonging to tropical and equatorial countries; "and so favourable," says Captain Boid, "is the character of the climate, that,

with care, scientific cultivation, and a choice of suitable localities, the productions of almost every part of the globe might be brought to perfection there. All those herbs and plants, celebrated for their medicinal qualities, essences, odours, and dyes, are to be found in abundance, and might, under the influence of commercial activity, furnish an immense source of wealth. Excellent coffee and tobacco grow luxuriantly, although now only cultivated for private consumption by a few individuals. All the most common, as well as delicate culinary vegetables known, are likewise included. White hemp and flax are both of fine growth, and furnish wherewithal to supply the poor with enough for their consumption of the manufactured produce.

"All the tuberose plants grow in these islands with great facility, and many are cultivated to a considerable extent, particularly the common and sweet potato, and the yam. The myrtle grows indigenously, and in large quantities: indeed it is so common, that the juice expressed from its branches is commonly made use of by the peasants for tanning their own leather.

"The fruits of the Azores might, by care and attention, be rendered, on account of the advantages of climate, even superior to those of any other country; but, in order for fruits to be brought to perfection, the exercise of delicate skill and horticultural science is generally requisite; and these being totally unknown here, many of the fruit-trees (of which every species may be seen) either bear no fruit at all, or such as is of a nature ungrateful to the palate: for instance, the peach, apricot, olive, and others. The luscious banana, however, grows here luxuriantly, and is not only a great acquisition as a fruit, but also gives an additional charm to the face of the country, from its beautiful and picturesque foliage, which fills up many a landscape with gracefulness, that to be duly appreciated should be seen, not described."

With respect to gardening, general absence of all taste or skill, nay, even of inclination to acquire them, is so great, that it is totally neglected, except amongst a few foreign settlers, English and American, who here and there display that refined taste which superior education always imparts, and at the same time they have furnished a proof of the perfection to which the productions of the vegetable world may be brought in this lovely climate. We might particularize the quinta or orange-grove of the American consul of Fayal, whose house, built by himself, stands on an eminence, looking towards the sea, in front of the picturesque mountain of Pico. The like observation may be made respecting the once noble palace of the ex-jesuits, (the most sumptuous erected by them in the Azores,) the splendid Carmelite monastery, with its Arabian turrets, and the convent of St. Antonio on an isolated terrace to the right. All these are more like the dreams of an Arabian tale, than real existence. At this point of the island is seen the mountain of PICO, which raises its sugar-loaf top at the background of our *frontispiece*, having its summit girt with clouds, or covered with snow. A crater exists at the top of this eminence, which constantly emits smoke. But in the part of Fayal, which the engraving at the head of this article affords a view of, is exhibited, at one *coup d'œil* in the surrounding gardens, the most striking and magnificent combination of beautiful shrubs and flowers peculiar to all climates and countries, that can be imagined. With all the rare productions that now constitute the pride of our European horticulturists, may be seen tastefully mingled the ornamental trees and plants of the tropics, namely all the various tribes of palms, the numerous species of cactus, the dragon's blood, aloe, Judas-tree, &c., which, blended with the fig-tree, our own admired weeping willow, the orange, lemon, and vine, produce an effect perfectly enchanting, nay even the beauty of our own native flowers is here improved! The hydrangia, geranium, and oleander, are of enormous growth; and the camelia japonica rises up with the height and strength of a forest-tree.

It appears that the orange was not known to the ancients, although some authorities think that this fruit is alluded to in Scripture, particularly in the 23rd chapter of Leviticus; one of the trees borne in the procession being supposed to be that of the orange. The most general opinion is that the Arabs first introduced this fruit into Europe. The Portuguese also in their voyages to India and China, found the orange in those countries at the beginning of the sixteenth century; and they also introduced the fruit into the Azores, which fruit at the present time is cultivated so extensively. Some interesting details respecting the orange have already been given in our fifth volume.

AMERICAN MARRIAGES.

THE first marriage ceremony I witnessed in America took place at the lonely little hamlet of Fort Erie in Upper Canada. I was then almost a stranger in the land, nevertheless, I received an invitation couched in phrase polite, from Major, *alias* Squire, W——n, (for he was a major of militia as well as a magistrate,) to attend the marriage of his eldest daughter. Although I then knew but little of the country and its inhabitants, I had been made acquainted with the narrowness of the major's circumstances, in short, of his comparative poverty; but this did not surprise me, since I knew it to be a very common case with many majors, colonels, and squires, on the western side of the Atlantic. The alliance which the major's daughter was forming was one that greatly delighted the father; for the individual was not only a man of unsullied reputation, but likewise a colonel of militia, and the keeper of a respectable "store," in a flourishing settlement, on the western part of Lake Erie.

It will not be out of place here to remark, that amongst the "better sort" of the inhabitants of Upper Canada, there is much aping of gentility, so that many families, in very indifferent circumstances, consider themselves as belonging to the aristocracy of the province, and profess to be much shocked with the boorish manners of the emigrant Scotch and English farmers, who are, in fact, ten times better off; and who, without suspecting anything of the gentility of the "early settlers," (probably judging from the poor appearance of their farms and dwellings,) take the liberty of locating themselves wherever they may be the best suited. I suspect that this aristocratic feeling has been mainly superinduced by the early settlers having had much familiar intercourse with the military officers formerly stationed amongst them; and though the forts have long since been dismantled, and the military removed from the upper part of the country, yet the people continue to tell of the "military balls," and "splendid routes," in the days that are long since passed.

It seemed to be the major's wish that his daughter's wedding should be no ordinary occasion; and, therefore, to make the matter *tell*, the greater portion of the "admissibles" of the Niagara district were invited to assemble at his small wooden cottage, at seven o'clock in the evening of an autumnal day. Presuming that punctuality would be looked for on

so "interesting an occasion," I found myself opposite the mouldering walls of the old fort, and therefore within a stone's cast of the major's dwelling, just as the report of the seven o'clock gun came booming across the eastern extremity of the lake from the (then) village, but now town, of Buffalo; and a few minutes afterwards I found myself in the midst of the bridal party. The major and his lady (all females, with exceedingly few exceptions, are *ladies* in America), were there to receive their guests in due form, and considering their condition in life, I was both surprised and pleased with the manner in which they acquitted themselves; for there was more genuine good-breeding in that little uncarpeted and wainscotted parlour, than in apartments which I had elsewhere seen, that were, in fact, perfect palaces compared with Squire W——n's lowly dwelling. Shortly after my arrival, I was ushered into a small adjoining room, (a bed-room, nine feet by seven,) where, upon a small dressing-table, were displayed two or three dozen pair of white kid-gloves, that would have done credit to one of the most fashionable shops in Bond or Regent-street. Where or how these things had been procured was a mystery to me; but having made my selection of a pair of suitable size, I again took my place in the company assembled from I know not how many counties. I afterwards understood that the small apartment was the dormitory of an itinerant schoolmaster, who, on the night in question, had been driven from his nightly quarters to make room for an occasion that might never again return. A murmur, rather audible than loud, presently pervaded the assembly; and by a little attention I soon gathered its meaning from those around me,—it was in consequence of the non-arrival of the Rev. Mr. L——g, the episcopal minister, who had been invited to perform the marriage ceremony. Now the reverend gentleman resided at Lundy's Lane, near the Falls of Niagara, and consequently eighteen miles distant from Fort Erie; and the roads being in bad condition, and the night unusually dark, some apprehension began to be entertained for the minister's safety.

Surmises to this effect caused the bride to look paler than usual, while the bridegroom became every minute more fidgetty; but, by-and-by, some one ventured to intimate that there was no reason to apprehend any serious disappointment, since there were no fewer than four magistrates present, any one of whom had the power, according to the law of the colony, of uniting the couple, in case the minister should not make his appearance. This, however, would not be doing the thing genteelly; but just as it was about to be carried into effect, the wagon containing the minister and his lady drove up to the door of the cottage. The delay had taken place in consequence of one of the bridges over the numerous creeks being in so bad a condition, that it was with the greatest difficulty that the vehicle could be got over at all, and this at the inconvenience of a serious injury to one of the wheels of the wagon. Without wasting more time, the reverend gentleman forthwith proceeded to marshal the company agreeably to the arrangements on such occasions. The usual ritual was read from a Book of Common Prayer; and, judging from appearances, there was no want of that proper feeling and decorum the occasion always seems to call for. When the ceremony was over, or rather when the minister had closed his book, he next saluted the blushing bride. This seemed the signal for a general rush on the male part of the company to follow up the clergyman's example; and somehow or other (without any exertion of my own) I found myself carried away by the tide into the immediate vicinity of the object of such general attraction, and the next moment my lips were pressed to that cheek which a few moments before I deemed should have been sacred to him alone who had solemnly pledged himself "to love and cherish unto death." At that time I was far from approving of this (said to be) a good old custom; but example and mechanical impulse carried me away from my purpose (for I had predetermined to stand alone, and be considered singular, rather than meddle with another man's property); and yet, probably there was no great harm in complying with the customs tolerated by "the better sort" of the people of Upper Canada.

No sooner were these matters concluded, than wine and its accompaniments were handed round to the company, and gladness seemed to brighten up every countenance. Apparently the clergyman was "master of the ceremonies;" for nothing seemed to be done without his sanction and approbation. Probably about an hour was passed in discussing the wines and the gossip of the district, when tea and coffee were handed round to the company, and shortly afterwards the major and the minister's lady placed themselves at the head of a country-dance. The reverend gentleman descended not from the dignity of his sacred character in joining in the mazes of the giddy dance; but, with few exceptions, the whole company partook of the *jumble*, for there was not sufficient space for one-third of the number to *dance* in. About twelve o'clock dancing was suspended in order to do justice to a sumptuous cold collation (sumptuous for the country where it took place), that Mrs. W——n and her friends had provided; when, that being over, the dancing was again resumed, and continued with much spirit until four or five o'clock in the morning, when the reverend minister announced that it was time to discontinue it, and the whole of the company assembled, except the reverend gentleman and his lady, acting upon the hint, betook themselves to their respective homes, highly gratified with the gay doings at the humble cottage of Major W——n.

In the interior of the United States, apart from the towns and cities, most of the marriages are performed by the civil authorities, since marriage is generally considered as a civil rather than a religious contract; and hence the very great number of divorces that annually take place. For the most part there is is very little show or festivity on those occasions, although it sometimes happens that a small party is invited to the residence of the parents of either the bride or bridegroom, in order to meet the newly-married couple on their return from the squire's, where they have been to have the marriage ceremony performed.

Some years ago I happened to be present at the house of a magistrate in Indiana, the keeper of a "house of entertainment;" when a little after the evening had closed in, a young man and woman waited upon the squire for the purpose of being married. After some half-hour's conversation between the squire and the young man, respecting "chopping, logging, and burning of fallows," and between the young woman and the squire's daughters concerning "quiltings and camp-meetings," the youth at length mustered the resolution to hint pretty broadly to the functionary the business which he and his companion had "called in" upon. The squire was not slow in intimating his willingness to proceed to business immediately; when the young man "guessed" that he wished previously to make him acquainted with one little particular which he calculated he had better first explain. The little particular amounted to this,

that they were unprovided with the cash necessary to discharge the usual fee; and without the squire would either take his "note of hand," or else give him a "little job of work," he was afraid that there might be some little difficulty. The squire, however, soon settled this point satisfactorily; for he informed his young neighbour that his father had previously applied to him on the subject of his (the son's) marriage, and representing to him the scarcity of cash, he had agreed to receive his fee or demand in wheat. Whereupon the happy youth gave the magistrate a nod of approbation, ejected the tobacco-juice, quid and all, into the corner of the fire-place, cast a sly look on the seemingly quiescent maiden, and then springing from his seat said, with considerable energy, "then I guess we be ready to be spliced." The "splicing," as he called it, was soon over; for after the squire had asked two or three questions relative to their ages, names, &c., he put the main questions, namely, "Will you have this woman for your wife?" and, "Will you have this man for your husband?" which having been duly answered by each party with a "Yes," accompanied by an affirmative nod, he declared, in the presence of his family and myself, that the parties were now and henceforward lawful man and wife. After the newly-married couple had been treated to "a drink" of boiled cider, the squire seeing that they were about to depart, addressed the young man with,—"I say Mr. ——, I guess you might as well tell the old captain (the young man's father) to let me have the wheat by to-morrow at sun-down, as I calculate on going to mill the next day, and might, as well as not, take it along with me."

The young couple set out for their respective homes, apparently as unconcerned and uninterested as they seemed when they arrived; and I could not help thinking that a couple of bushels of wheat, worth six or seven shillings, was the most weighty consideration in the whole business. J. B. B.

SPLENDID APPEARANCE OF JAMAICA.

THIS beautiful isle, happily screened by Cuba and Hispaniola from the tempestuous winds of the Atlantic, and peculiarly adapted for an extensive and profitable commerce with the adjacent continent, by reason of the number and disposition of its excellent havens, is really one of our most valuable colonies. Jamaica is somewhat of an oval shape, with an elevated ridge, called the "Blue Mountains," (towering in some places to nearly eight thousand feet above the level of the sea,) running longitudinally through the isle east and west, and occasionally intersected by other high ridges, traversing from north to south; approaching the sea on the south coast in gigantic spines of sharp ascent—difficult of access, and clothed with dense and sombre forests;—on the north declining into lovely mounds and round-topped hills, covered with groves of pimento, and all the exquisite verdure of the tropics,—the *coup d'œil* presenting a splendid panorama of high mountains, embosomed in clouds, and vast savannahs or plains, hills and vales, rivers, bays, and creeks. The midland is spread for an extent of many miles with an infinite number of round-topped hills, whose surface, covered with a loose lime-stone, or honey-combed rock, is clothed with fine cedar and other trees, of enormous bulk; the dales or cock-pits meandering between these hummocks contain a rich soil, of great depth, where the succulent Guinea grass forms a perfect carpet of ever-verdant beauty.

When viewed at a distance from Point Morant (the southernmost high land on the coast), the picture is splendid; the Blue Mountains appear above the stratum of clouds which roll along their precipitous sides,—beneath, the rugged hills are furrowed with ravines, and steep cliffs descend abruptly to the sea, and on a nearer approach lofty forests are seen, and slopes of bright, emerald green.—MARTIN'S *West Indies*.

VITRIFIED FORTS OF SCOTLAND.

II.

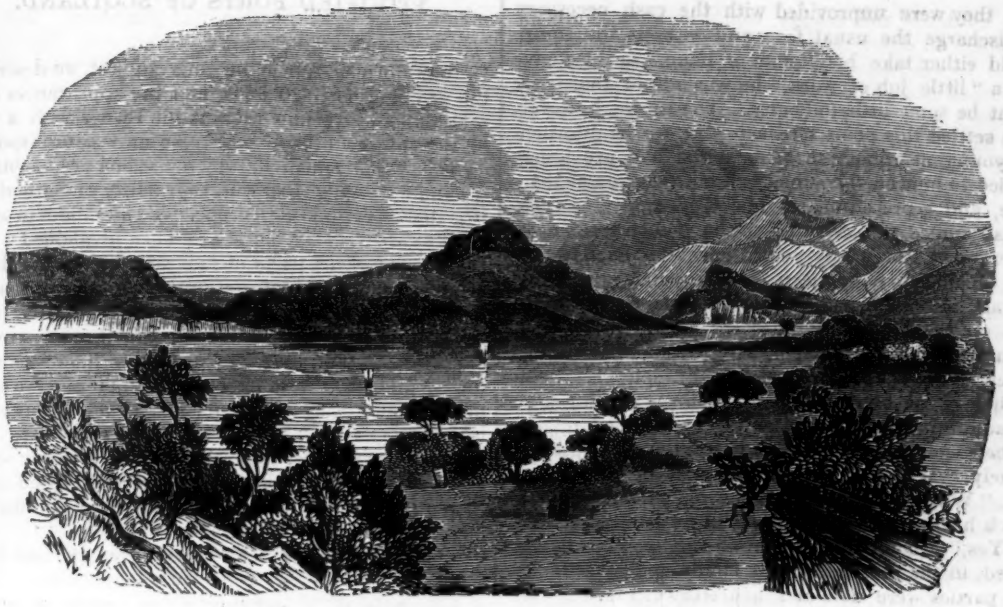
IN our former article on this subject we described the principal vitrified forts, and the appearances they present; and we now present the reader with a view of one of the hills of which we have before spoken, on which the remains of fortifications are visible:—we allude to *Dun Creich*, in the county of Sutherland. We shall now proceed to speak of the modes in which their origin and purpose has been explained. The principal theories relating to this subject are three; viz., 1st. That fire had been used for the purpose of cementing the walls of the forts, by fusing the materials of which they are made; and that the vitrified appearance which they now present is thus accounted for. 2nd. That the vitrification had been caused, not in the *erection*, but in the *destruction*, of the buildings, of which we now see only the ruins. 3rd. That the vitrification has been caused by making signal fires on the hills, during an early and disturbed period in the history of Scotland. These three opinions we shall treat of in the above order.

The vitrifications were first brought under the notice of the public by Mr. Williams, a surveyor in Scotland, in 1777, and two or three years afterwards Dr. Anderson, in the *Archæologia*, made further remarks upon them. He says,

> These walls consist of stones, piled rudely upon one another, and firmly cemented together by a matter that has been vitrified by means of fire, which forms a kind of artificial rock, that resists the vicissitudes of the weather better perhaps than any other artificial cement that has ever yet been discovered. All the walls of this kind that I have yet seen or heard of, have been evidently erected as places of defence. They, for the most part, surround a small area on the top of some steep conical hill, of very difficult access. It often happens that there is easier access to the top of one of these hills at one place than at any other; and there they have always had the entry into the fort, which has always been defended by outworks more or less strong, according to the degree of declivity at that place. If the form of the hill admitted of access only at one place, there are out-works only at one place; but if there are more places of easy access, the out-works are opposed to each of them, and they are proportioned in extent to the nature of the ground.

Dr. Anderson proceeds to remark, that it appears surprising at first sight, that the natives should have been capable of discovering a cement of such a singular kind as this is;—that it is less surprising that the knowledge of it should not have been carried into other countries, as distant nations in those periods had but little friendly intercourse with one another; but that it is no difficult matter for one who is acquainted with the nature of the country where these structures abound, to give a very probable account of the manner in which this art has been originally discovered, and of the causes that have occasioned the knowledge of it to be lost, even in the countries where it was once universally practised. These remarks are evidently due to an opinion that the vitrification was the designed effect of the builders of the forts.

He advances his hypothesis thus:—Having made choice of a proper place for a fort, the builders would rear a wall all round the area, building the outside of it as firm as they could of dry stones, piled one above another, the interstices between them being filled with a vitrescible iron ore, which abounds in the northern parts of Scotland. When the wall was thus far completed, with its facing all round, reared to the height they wished for, nothing more was necessary to give it the entire finishing, but to kindle a fire all round it, sufficiently intense to melt the vitrescible ore, and thus to cement the whole into one



VIEW OF DUN CREICH, IN THE COUNTY OF SUTHERLAND.

coherent mass, as far as the influence of that heat extended. As the country then abounded with wood, this purpose would be readily effected by building a stack of wood round the whole outside of the wall, and then setting it on fire. It was probably with a view to enable them to build this stack of wood with the greater ease, and to suffer the fire to act more forcibly and equally upon the different parts of the wall as it gradually consumed, that they were induced to incline the walls so far from a perpendicular position. In an after period, when the woods had gradually been destroyed, and before it was well known how to manufacture peat for fuel, it would be such a difficult matter to procure fuel in abundance, that buildings of this kind would come to be disused, and the art, in a short period, among a people ignorant of letters, would be entirely forgotten.

Mr. Tytler in a communication to the Royal Society of Edinburgh, states his opinions somewhat as follows:—The buildings reared by the ancient inhabitants of this country, both for habitation and defence, would naturally be composed of such materials as the rude state of the country presented in abundance, and such as required little either of labour or of skill to bring into use. In those quarters where stone could be easily quarried into square blocks, or where it splits into laminæ, no other material than the simple stone was necessary, and very little labour was sufficient to rear the structure. But where the stone is of such a nature as not to be easily split into square blocks, or separated into laminæ, but breaks into irregular fragments, it would be difficult to form a regular structure of such materials alone.

The mode in which the fabric was built in the latter case was, probably, by employing wood as well as stone. The building was begun by raising a double row of palisades or strong stakes, in the form of the intended structure. These stakes were, probably, warped across by boughs of trees, laid very closely together, so as to form two fences, running parallel to each other at the distance of some feet, and so close as to confine all the materials, of whatever size, that were thrown in between them. Into this intermediate space were probably thrown boughs and trunks of trees, earth and stone of all sorts, large or small as they could quarry or collect them. Very little care would be necessary in the disposition of these materials, as the outward fence would keep the mound in form. In this way it is easy to conceive that a very strong bulwark might be reared with great dispatch, which, joined to the advantage of a very inaccessible situation, and that improved by artful contrivances for increasing the difficulty of access, would form a structure capable of answering every purpose of security or defence.

The most formidable engine of attack against a structure of this kind, would be fire; and this, no doubt, would be always attempted, and often successfully employed by a besieging enemy. The double ramparts, at a considerable distance from each other, and the platform at one end, were certainly the best possible security against an attack of this kind. But if the besiegers prevailed in gaining an approach to the ramparts, and surrounding the external wall, set fire to it in several places, the conflagration must speedily have become general, and the effect is easy to be conceived. If there happened to be any wind at the time, to increase the intensity of the heat, the stony parts could not fail to come into fusion, and, (as wood burned away,) sinking by their own weight into a solid mass, there would remain a wreck of vitrified matter, tracking the spot where the ancient rampart had stood; irregular and of unequal height, from the fortuitous and unequal distribution of the stony materials of which it had been composed. The appearance at this day of these vitrified mounds creates the strongest probability of the truth of this conjecture.

This, then, is the second theory. We proceed to the last,—that of Sir George Sinclair.

He supposes that, for fear of an invasion, or any hostile attack, the natives were accustomed to burn fires on the hills, so as to serve as beacons of communication from one part of the country to another, and that the fires thus kindled vitrified the surface of the stones near them. To be satisfied of the reason why the signal fires should be kindled on or beside a hide of stones, he considers that we need only imagine a gale of wind to have arisen when the fire was kindled on the bare ground. The fuel would be blown about and dispersed, to the great annoyance of those who attended it. The plan for obviating the inconvenience thus occasioned, which would occur

most naturally and readily, would be to raise a heap of stones, on either side of which the fuel might be placed to windward. To account for a large extent of vitrified matter in a line or semicircle, it is only necessary to allow the inhabitants of the country to have had a system of signals. A fire at one end might denote something different from a fire at the other, or in any intermediate parts. On some occasions, two or more fires might be necessary, and sometimes a fire along the whole line.

It seems evident to the same writer, that the people who formed the structure on Dun Creich had no idea of applying fire for the purpose of strengthening the ramparts, and had not even taken the hints afforded them by the effects of the signal fires. Hence the appearances at this place seem to demonstrate the fact, that the vitrifications have been occasioned by the lighting of signal fires, to warn the inhabitants of the approach of an enemy, or to convey the orders of a chieftain to his dependants. It appears, too, that such signals have been common after the use of lime mortar was known, since we find on this hill the remains of a building constructed with it. This may have served the double purpose of a watch-tower, and the habitation of the people who had charge of the station. At the head of the valley are the remains of an old castle, with which the station was probably connected. These signal fires were within sight of one another, throughout a long range of hills.

Here, then, the reader is presented with three different modes of accounting for the same phenomenon. All the writers speak from personal inspection of the objects, and therefore are worthy of attention independent of their high character. We think, therefore, that the true mode of accounting for the vitrified forts has yet to be determined.

THE ART OF JAPANNING.

I.

THERE is no country in the world better deserving of notice than Japan; and there is no people (not even the Chinese) more remarkable for their strict seclusion than the Japanese. This nation, we know not how many centuries ago, attained a wonderful degree of refinement in the arts and discipline of life, in which it has probably never since progressed. The complete state of insulation in which it holds itself from other nations has been favoured by nature; for the three islands which form the empire of Japan, present difficult rocky boundaries to a stormy sea. This country is rich in mineral and botanical productions, and may be said to support itself without any commercial aid from other nations.

Those Europeans who have, from time to time, attempted to settle in the country for commercial purposes, have been treated with the greatest severity, and in many cases have been put to death. The Dutch only have been tolerated; and they are under the most severe restrictions, and are even constantly exposed to danger. They are allowed a small corner only of the port of Nangasaki, in the Kinsin isle, where, enclosed in a sort of prison, and subject to every sort of mortification and humiliation, they are allowed to dispose of two cargoes annually. They import various articles of colonial produce, spices, and hardware, in return chiefly for the admirable, and indeed unrivalled, copper of this country; together with some trifling articles of japanned and lackered wares.

The Japanese are said to excel in agricultural pursuits; but they do not equal the Chinese in the manufacture of silk, cotton, and porcelain. They are well acquainted with the metallurgic arts; the fabrication of arms, and the making of glass; and there is one art in which they excel all the rest of the world; that of covering thin vessels with a rich, dark, varnish, and raising above it artificial flowers and ornaments.

This art is called by the Europeans JAPANNING, from the name of this country, whence the art was first introduced into Europe. This art is also practised extensively by the inhabitants of China, Siam, and other eastern parts of Asia; and we now proceed to give an account of its processes, as adopted in Europe, and, as far as is known, in Japan, &c.

Japanning, as we have said, consists in covering articles of wood, metal, paper, &c., with various pigments and varnishes, in a peculiar manner, so as to preserve and ornament them. The colour thus given is sometimes uniform; sometimes variegated, so as to represent marble, tortoise-shell, or scarce woods; and sometimes a black ground is relieved by coloured figures, so as to produce a kind of painting, and these figures are often gilded or silvered. But the principal characteristics which distinguish japanned work are its great hardness, and very high polish.

The method of Japanning, as practised by the above mentioned eastern nations, differs greatly from that of Europe. The principal cause of this difference is that the former possess a tree, producing a kind of varnish which is the chief substance used by them in japanning. It is collected (like Indian rubber, and many other similar substances) simply by making an incision in the lower part of the trunk, and the varnish flows out. It has at first the colour and consistence of cream; but to render it fit for use it is poured into a large shallow vessel, and stirred for several hours, that every part may be equally exposed to the air. This causes it to turn perfectly black; a quantity of finely powdered charcoal is then added, and it is fit for use. The article to be japanned first receives one or two thin and even coats of this substance, which, after being dried in the sun, soon becomes excessively hard. It is then polished with water and a smooth kind of stone, until it is as smooth and bright as glass. As far as this, the process is the same, whatever colour or pattern is required. Another kind of varnish is now used, composed of turpentine and a peculiar oil prepared by the Japanese. If the article is to be of a uniform black colour, this varnish is simply laid on without any admixture, and being transparent, it allows the first varnish, which is of a black colour, to be seen through it. The process is then complete. But if any other colour except black be required, the pigment, which must be an opaque one, is mixed with this second varnish, and laid on with great care, to preserve it even and smooth. But one of the most common kinds of japanned work is that in which gold or silver figures are produced on black ground. This is done before the final varnish is laid on. After the black ground has been polished, the figures are drawn on it with the same varnish as that afterwards used. Before this is quite dry, the gold or silver leaf is laid on, and adheres to the damp figures, but not to the dry surface surrounding them. The superfluous gold or silver leaf which does not adhere, is then removed, and the whole receives the finishing coat as before.

European japanning was formerly performed in the same manner, the peculiar substance used being imported from Japan for the purpose. But an artificial method of imitating the oriental japanned work was discovered, and superseded the eastern method, which, although far superior to ours, in hardness and durability, is very injurious to the workers in it, owing

to the poisonous nature of the juice of the tree above mentioned.

The European method consists, first in laying on a kind of coloured varnish, called a japan ground, which has the property of turning exceedingly hard. It is then painted, gilt, or silvered, if required, and lastly receives several coats of a hard transparent varnish, which is capable of receiving a high polish, and is always laid on over everything else, whether the ground be plain or figured. All these processes we will briefly describe.

Before the japan ground is spread on, a priming is sometimes necessary, if the article be rough, to fill up all the inequalities of surface and render it smooth and even. This is of course always necessary for the coarser kinds of wood, and was formerly used for all substances. But it is now never used, except when the surface is so uneven as to render it absolutely necessary; since it has been found that the work is much more durable when no priming is used; because the japan then adheres more strongly to the substance beneath, and therefore is less liable to crack and peel off. Articles of metal, *papier maché*, and the finer sorts of wood, are therefore never primed.

The priming for common japan work consists of whiting, mixed with very strong size, to such a consistency that it may form an opaque coat on whatever it is laid. For work of a superior kind, parchment size is used, instead of common size; and this is greatly improved by the addition of one-fourth of isinglass, which renders it less liable to crack and peel off. When this priming is used, the article is first covered with a coat of rather weak size, such as the common size, diluted with two-thirds of water, and used hot. When this is dry, the priming is spread with a paint-brush as evenly as possible. The number of coats used is never less than two, and between each, the article is allowed a day or two to get perfectly dry.

Of course the rougher the surface is, the more coats of priming it will require. The method of discovering whether the priming be thick enough, is by rubbing it with a wet rag or sponge, when, if it does not receive a polish, more priming is necessary to make the surface more even. When the priming is found sufficiently thick, the work is ground smooth with Dutch rushes or fine glass paper. It then receives another coat of priming which, when dry, is polished with a moistened rag or sponge, and it is then fit to receive the japan ground.

Leather, metals, *papier maché*, and fine hard wood require no priming; but, before being japanned, they are cleaned, well dried, placed in a warm room, and covered with two or three coats of a coarse varnish, which is laid on with a flat camel's-hair pencil. This varnish is made by dissolving two ounces of seed-lac and two ounces of resin in a pint of spirit-of-wine, and straining it. It must of course be allowed to dry between each coat.

When the article has been thus prepared, it is ready to receive the japan ground, which, when it is to be of one uniform colour, is composed of the proper pigment mixed with a varnish. The varnish commonly used is called shell-lac varnish, and is thus prepared:—"Take of the best shell-lac five ounces, break it into a very coarse powder, and put it into a bottle that will hold about three pints or two quarts; add to it one quart of rectified spirit-of-wine, and place the bottle in a gentle heat, where it must continue two or three days, but should be frequently well shaken. The gum will then be dissolved, and the solution should be filtered through a flannel bag; and when what will pass through freely is come off, it should be put into a proper sized bottle, and kept carefully stopped for use. The bag may also then be pressed with the hand till the remainder of the fluid be forced out; which if tolerably clear, may be employed for coarser purposes, or kept to be added to the next quantity that shall be made." To make the japan ground, any kind of pigments may be mixed with this varnish, in such proportions as to produce the required colour, but they must first be ground very smooth with spirit-of-turpentine.

When the colour of the ground is required to be very brilliant, it is not mixed with this varnish, but with mastic varnish, which is thus prepared:—"Take five ounces of mastic, in powder, and put it into a proper bottle, with a pound of spirit-of-turpentine; let them boil in a gentle heat till the mastic be dissolved, and if there appear to be any foulness, strain off the solution through flannel."

The method of making and using the different coloured grounds will be described in the next article on japanning.

ON THE DEFENCES OF ANIMALS.

In many land animals, under all forms, the sole defence is the power of escape, though weapons are sometimes superadded. In the hare, it is the defence against superior strength; the power of the fore-paws is efficient against the smaller enemies. In the Deer tribe it is the true, and, except under extreme danger, the only defence; in the Horse family, and the camelopard, the instinct and the power of using the hoofs are superadded. In the natural state, the fleetness of the sheep, aided by the watchful and posted centinel, and added to a power of climbing, like the goat, where few animals can follow it, constitutes the general defence against single animals of prey. The instinct to fly is always added to the power of escape: so regularly are the powers and the propensities for ever associated.

Few weapons of defence have been provided for the birds; and such as they are, being limited to spurs on the legs, rarely on the wings, and still more rarely on the head, they seem intended for the same peculiar uses as the horns of the deer, belonging to the polygamous tribes. The power of flying is an ample defence against the purely terrestrial animals, as it is such even against their carnivorous fraternity: a very small number only, in the falcon family, having the power of taking their prey on the wing, and this with much difficulty.

This also is the great mode of defence in the flying insects; while the velocity and the rapidity of their angular motions render it effectual against most enemies; few but the bat, the swallows, and the night-hawk, with their own peculiar tyrant the dragon-fly, being able to contest in flight with them, as neither of those could succeed in securing them, were it not for their capacious mouths. In the fishes, velocity is equally the predominant defence, though many are also provided with defensive weapons. Here, this power becomes especially effective, from that disposition of colour, which renders them invisible, by changing their level with respect to the pursuer, and from the imperfect vision at long distances, which follows from the deficiency of light in the sea. Perceiving also that the more voracious fish are ill constructed for rapid motions, as is the gurnard for example, and that the smaller species of the shark tribe, though better formed, are exceedingly sluggish.

If velocity is a passive system of defence, concealment forms another. The instinct of burrowing unites habitation with defence. In the rabbit, the badger,

the fox, and more, this is familiar; and it occurs in birds, in the well-known instances of the puffin and the sand-swallow. The owl of South America is permitted a joint territory in the burrow of the *Lepus viscaccior*. Many animals which do not burrow, inhabit natural crevices or caverns; as the fox, showing the power of reason over an instinct, declines digging in the rocky situations where it can find a convenient hole. The excavation made by a sparrow, the nests of the swallow and the wren, and the much more remarkable suspended ones in hot climates, are other instances of united defence and dwelling, which natural history can easily extend. In the fishes, the burrowing of the eel and others may be simply the pursuit of food; but the flat fishes conceal themselves in this manner, under alarm, and with great rapidity. That the inhabitants of the weedy and rocky shores make use of this defence is well known to fishermen, and very remarkably in the case of the loach, enticed from its hole by music; as seems also to occur in the trout. It requires all the silence and cunning of the oyster-catcher to surprise the limpet; and nothing short of the vegetable patience of the actinia could continue to insinuate a tentaculum within the obstinate cover of a periwinkle. The razor-fish and the cockle, burrow, in addition, safe from all but the sand-eel; and the pholades, with shells too feeble and too open for defence, are protected in the caverns which they have been taught to excavate in the rock.

In the crustaceous marine animals, and in the insects, the same system of defence prevails. The shells are more than habitations, since they are both skin and bone to the animal; but they are often defences withal, and very effectual ones. The cod swallows a small crab, but it cannot break the shell of that which is too large for its mouth. The beetle tribe, very widely, may be trod on without injury; and we rarely kill an ant by walking over their armies, unless it be on a very smooth and hard gravel-walk. The forest-fly, as all know, defies a strong hand. Among these also we find the system of burrowing, and that of concealment in natural cavities or otherwise, very widely spread. The crab burrows in the sand, the lobster hides itself in the crevices of rocks, in addition to the security derived from its hard covering and its defensive weapons. Thus also do the brown shrimps conceal themselves in the mud, and the horned ones among the weeds; as this mode of concealment pervades all the lower marine tribes very widely.

In the proper insects, or rather in the parent worm, the structures formed by some of the sub-aquatic larvæ, out of gravel or fragments of sticks, are the most remarkable, being habitations and also defences. The sabella, uniting sand in the same manner, may be associated with these. The hermit crab also may take its place here, since the empty shell which it chooses is equivalent to the den of the fox; but the burrowing insects and worms are so numerous, that no examples need be given: to hide, in this manner or in natural crevices, may be viewed as a sort of universal defence for the race at large.

A mode of concealment through colour is the most universal of all the systems of defence, and it pervades all the races of animals. In the hare its efficacy is well known, as is the consciousness of the security which it affords. But in the quadrupeds, this is much less resorted to than in the birds, where it appears intended to deceive the predatory animals of their own class, rather than those of the earth. In the partridge, the quail, the woodcock, the snipe, and more, the conformity of the colours to the ground is such as to conceal the animal from every eye, even from the acute sight of their enemies, the kite and the hawk. Thus do the smaller birds deceive them, even where the apparent conformity of colour is not great; since we often see the hovering hawk abandon its pursuit, although the expected prey has not escaped. Under this system of defence, as under all others, the animals seem perfectly informed of its nature and value, as the chamelion is in its voluntary changes of tint; and thus, apparently, do the lark and other small birds shift their position under the hawk's eye, till they find the colour which they know to be efficacious.

The same mode of defence has been given to the fishes. In the whole of these, the under part is white while the upper is covered in some manner; or the exceptions at least are rare, occurring also in those which seem to reside always among sea-weeds, where the purpose of colouring the whole body is the same. In the high-swimming kinds, moreover, the whiteness beneath is brilliant, while it becomes a dead and dull one in those which seek the bottom or are compelled to reside there. The object of the variation, as well as of the primary contrivance is apparent, on reflecting that the enemy from below views them against the light of the sky, and that this light diminishes in intensity as it passes through a body of water. It is probable that the fishes can as little see each other in this direction, as we can discern them from above.

In insects, the defence through colour is often the only one which they possess. The green caterpillars, grasshoppers, and aphides, are among the most obvious examples, as their chief enemies are the birds. But the contrivances for concealment are carried even further in some insects; enabling them to imitate form as well as colour. Some caterpillars erect a part of their body, when adhering to a tree, so as to resemble buds, or the stumps of branches; another is so like the black flowers of the sedges on which it reposes, that the sharp-sighted birds often pass it over; and others resemble a dry leaf; while every collection displays those singular imitations of leaves and sticks, which occur, among others, in the phasma, a former source of wondering tales.

But analogous modes of concealment, more or less departing from those, are numerous and various. Many insects cover themselves with sand, chalk, dust, or other substances which they inhabit, thus escaping notice; as some of them also use these masks for the purpose of ensnaring their prey. A domestic cimex dresses itself in fragments of wool and feathers; the cancer phalangium cuts off the leaves of a small fucus, and fixes them on its long hairs, so that even a practised botanist may take it up as a specimen of the plant. In this case, however, the purpose seems to be rather stratagem than defence; it is a trap for shrimps, but it is applicable to both objects. Natural history must however be consulted on the subject of stratagems, since it possesses no peculiar interest for the present purpose.

[Abridged from MACCULLOCH'S *Proofs and Illustrations of the Attributes of God.*]

SOME plants discover a peculiar susceptibility of atmospherical agencies. If the Siberian sow-thistle shuts at night, the ensuing day will be fine; if it opens, it will be cloudy and rainy. If the African marigold continues shut after seven in the morning, rain is at hand. The Convolvulus Arvensis, Calendula Fluvialis, and the Anagallis Arvensis, or Poor Man's Weather-glass, close on the approach of rain. —LOUDON'S *Enc.*

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